

L 42803-66 ENT(1)/T IJP(c) AI/JXI(CZ)SW

ACC NR: AT5022065

SOURCE CODE: UR/2531/65/000/179/0108/0117

AUTHOR: Mukhenberg, V. V.

ORG: none\*

TITLE: Certain characteristics of the incidents of solar radiation on inclined surfaces

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy, no. 179, 1965.  
Teplovoy balans (Heat balance), 108-117

TOPIC TAGS: cloud cover, solar radiation, optic albedo, solar radiation intensity

ABSTRACT: Experiments were set up during the summer of 1963 in Yygeva, Estonian SSSR, which is situated slightly south of Leningrad, to elucidate the characteristics of the diurnal variation of solar radiation arriving on model inclined surfaces having different curvatures and orientation. All measurements were carried out in agricultural fields for 23 days, during which 7 days were clear, 6 days were cloudy, and the remaining 10 days had a partial cloud cover. The albedo values of the subjacent surface varied from 21 to 23%. A Yanishevskiy pyranometer was used to observe solar radiation. Global and diffuse radiation arriving on inclined surfaces with a curvature of 10, 20, 30, 40, 60, and 90° oriented in succession northward, southward, eastward, and westward, was measured. Direct solar radiation arriving on a surface perpendicu-

Cord 1/2

L 42803-66

ACC NR: AT5022065

lar to the rays was measured by a thermoelectric Yanishevskiy actinometer and then it was used for converting the direct radiation arriving on an incline. The investigations revealed that southern slopes with an angle of inclination of  $40^\circ$  received the maximal quantity of global radiation. The dependence of the arrival of global radiation on curvature of the incline is almost identical for conditions of a cloud-free sky, partial cloud cover, and clouds of the upper level. Under conditions of a cloudy sky the arrival of global radiation onto slopes decreases with density of the cloud cover. The dependence of diffuse radiation of the elevation of the sun is less evident. Some increase in radiation when the slopes are faced toward the sun is caused by an increase of radiation reflected from the horizontal surface. Orig. art. has: 3 tables and 5 figures.

SUB CODE: 03/ SUBM DATE: none/ ORIG REF: 011

Cord 2/2 LL

TRABER, D.G.; SARKTS, V.B.; MIKHENOV, I.P.

Heat transfer from the fluidized bed of granular materials to the  
surface of heat exchange. *Zhur.prikl.khim.* 33 no.10:2197-2205  
0 '60. (MIRA 14:5)

1. Leningradskiy tekhnologicheskii institut imeni Lenooveta.  
(Heat-Transmission) (Granular materials)

LUKHER, A.A.

34014 ~~LUKHER, A.A.~~ Ustroystvo  
Stroboskopa S Nyeonovoy Lampochkoy  
Byullyetyen' Vsesoyuz Astron-Gyeo-  
Dyez O-Va, No. 7, 1949 S. 31-32

50: Letopis' Zhurnal'nykh Statey, Vol. 42, Moskva, 1949

S/169/61/000/012/037/089  
D228/D305

AUTHORS: Gordeyev, Yu. I., Mukher, A. A., and  
Srebrodol'skiy, D. M.

TITLE: The present state of radiometric methods and  
their effectiveness in the study of sections  
of oil, gas, ore, and coal holes

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 12, 1961,  
43, abstract 12A413 (V sb. Radioakt. izotopy  
i yadern. izlucheniya v nar. kh-ve SSSR. v. 4.  
M., Gostoptekhizdat, 1961, 30-33)

TEXT: Methods of gamma-logging (GL) and neutron gamma-  
logging (NGL) have obtained the widest application in the study  
of wells drilled in oil and gas deposits, the method of gamma-  
gamma-logging (GGL) being most used in investigating exploratory  
coal boreholes. The method of NGL is used in investigating holes  
drilled during prospecting for boron material, while the method

Card 1/2

The present state of...

S/169/61/000/012/037/089  
D228/D305

of selective GGL is employed when searching for deposits of lead, tungsten and mercury. The method of neutron activation is used when studying the displacement of water neutron-logging. [Abstracter's note: Complete translation.]

Card 2/2

MUKHIDINOV, N.

Numerical solution of a system of equations describing the  
processes of infection, storage, and sampling of a ga. in  
artificial gas holders. Vop. vych. mat. i tekhn. no.1:66-87 '64.  
(MIRA 18:8)

CHARNYI, I.A.; MUKHIDINOV, N.M.

Change in the reservoir pressure in the development of a gas  
field in an unbounded water-bearing bed. Gaz. prom. 7 no.11:  
9-13 N '62. (MIRA 17:9)



HAZAROV, S.N.; VIL'MIZOV, A.G.; MAVLYANOV, A.; MUKHIDOV, A.

Terpedeing oil wells with large charges. Izv. AN Uz. SSR. Ser.  
tekhn. nauk no.5:95-99 '58. (MIRA 11:12)

1. Gernyy etdel AN UzSSR i Geofizicheskaya ekspeditsiya Uzbekskogo  
geologicheskogo upravleniya.  
(Oil well drilling) (Blasting)

. MUKHINA A, Z. A.

USSR/Analysis of Inorganic Substances

G-2

Abs Jour: Ref Zhur-Khripina, No 6, 1957, 1955#

Author : Z. S. Mukhina, A. A. Tikhonova

Inst : -

Title : Polarographic Determination of Niobium and Tungsten in Alloys.

Orig Pub: Zavod. Laboratoriya, 1956, 22, No 10, 1154 - 1156

Abstract: A distinct polarographic wave corresponding to the reduction of Nb to  $Nb^{2+}$  appears in the medium of 10 n HCl in presence of the complex producer K citrate. E<sub>1</sub> of Nb is -0.20 v (satur. a. c.). Tungsten present in complexly alloyed steels also produces a polarographic wave in 40 ml of HCl (1:1), HNO<sub>3</sub> is added and the solu-

Card 1/3

- 136 -

USSR/Analysis of Inorganic Substances

G-2

Abs Jour: Ref Zhur-Khimiya, No 6, 1957, 19654

tion is evaporated until the remainder is dry. The remainder is treated with concentrated HCl and the solution is evaporated; the remainder is treated with 2% HCl, the solution is filtered, and the remainder is fused with 4 to 5 g of  $K_2CO_3$  (to eliminate Ti, Cr, Si, Fe and other components). The fused mass is leached out with water, the solution is diluted to 100 ml and filtered; 10 ml of the filtrate are boiled down to 5 ml, 0.2 ml of 50% K or Na citrate solution and 30 ml of concentrated HCl are added, also 5 drops of 0.5% solution of joiner's glue and HCl to make up to 50 ml are added,  $N_2$  is passed through for 15 to 20 min., and it is polarographed. Contents

Card 2/3

- 131 -

25 NOV 60

USSR

MUKHIN, A., senior scientific associate, Acad. of Construction and Architecture,  
USSR, is the author of an article entitled "An Industrial Base for  
Agricultural Construction."

Sovetskaya Moldaviya, 25 NOV 60

bz

1. BURDAK, N.M.; MUKHIN, A.A.; ENGEL', F.F.

2. USSR (600)

4. Drainage

7. New method for lowering the water level, N.M. Burdak, A.A. Mukhin, F.F. Engel'.  
Mekh.trud.rab. 7 no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

MUKHIN, A.A., assistant

~~Apparatus~~ Apparatus for determining the electroosmotic properties of soils.  
(MLA 8:7)

Trudy MBI no.14:133-143 '53.

(Soils—Electrical properties) (Electric apparatus and  
(Electroosmosis) appliances)

MUKHIN, A. A.

MUKHIN, A. A.: "Some problems in the theory and practice of electroosmotic water-reduction". Moscow, 1955. Min Higher Education USSR. Moscow Order of Lenin Power Engineering Inst Imeni V. M. Molotov. (Dissertation for the Degree of Candidate of TECHNICAL Sciences)

SO: Knizhnaya Letopis' No. 51, 10 December 1955

MUKHIN, A.A., kandidat tekhnicheskikh nauk.

Determining optimum specific loads on electrodes during electroosmotic water lowering. Trudy MEI no.18:102-115 '56. (MLRA 10:1)

1. Kafedra teoreticheskikh osnov elektrotekhniki.  
(Electroosmosis) (Soils--Electrical properties)



BURDAK, N.M., kand.tekhn.nauk; MUKHIN, A.A., kand.tekhn.nauk; NEFUSKIL,  
A.V., prof., doktor tekhn.nauk

Modeling and calculating electro-osmotic lowering of water.  
Trudy MEI no.27:67-87 '58. (MIRA 13:4)  
(Drainage)

TSYAO U-CHZHI [Ch'iao Wu-shin]; MUKHIN, A.A., nauchnyy rukovoditel ,  
kand. tekhn. nauk, dotsent

Laboratory investigation of free vibration in wheeled tractors.  
Izv. TSKHA no.5:229-232 '62. (MIRA 16:7)

(Tractors--Vibration)

MUKHIN, A. A.

Plows

Variation in the traction properties of a tractor and the draft resistance of a plow in relation to the direction of the draft line in a horizontal plane. Mekh. elek. sel'khoz. No. 1, 1953.

Monthly List of Russian Accessions, Library of Congress, June 1953. Uncl.

1. MUKHIN, A. A.
2. USSR (600)
4. Plows
7. Effect of the height of a tractor hitch on the draught characteristics of a plow assembly. Mekh. i elek. sel'khoz. No. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

**MUKHIN, A.A.**

[Ways of increasing the operating efficiency of tractors and attached equipment] Puti povysheniia proizvoditel'nosti traktornykh agregatov. Moskva, Trudrezervizdat, 1955. 116 p.

(MLRA 8:12)

(Machine-tractor stations) (Tractors--Repairing)

MUKHIN, Aleksandr Alekseyevich; PESERYAKOV, A.I., inzh., nauchnyy red.;  
SEREBRENNIKOVA, L.A., red.; SUSHKEVICH, V.I., tekhn.red.

[Methods for efficient utilization of tractor-driven machinery]  
Metody ratsional'nogo ispol'zovaniia traktornykh agregatov.  
Moskva, Vses.uchebno-pedagog.izd-vo Trudreservizdat, 1957. 102 p.  
(MIRA 14:1)

(Agricultural machinery)

ANDREYEV, Georgiy Pavlovich; ANDREYEV, Sergey Nikolayevich;  
BOGOLYUBOV, Valentin Yevgen'yevich; BURDAK, Nadezhda  
Mironovna; ZHUKHOVITSKIY, Boris Yakovlevich; ZEVEKE,  
Georgiy Vasil'yevich; KARAYEV, Ruben Iosifovich; LEVITAN  
Semen Arkad'yevich; MUKHIN, Aleksandr Andreyevich;  
NEGNEVITSKIY, Iosif Borisovich; PEREKALIN, Mikhail  
Aleksandrovich; POLIVANOV, Konstantin Mikhaylovich, prof.,  
doktor tekhn.nauk; FRIDKIN, L.M., tekhn. red.

[Problems of theoretical principles of electrical engineering;  
theory of networks] Zadachnik po teoreticheskim osnovam elektro-  
tekhnika; teoriia tsepei. [By] G.P. Andreev i dr. Moskva, Gos-  
energoizdat, 1962. 159 p. (MIRA 15:12)  
(Electric engineering) (Electric networks)

VEYTSMAN, N.R., prof.; VENETSKIY, I.G., dots.; ZHUKOV, F.N., dots.;  
MUKHIN, A.F., dots.; YEPIFANOV, M.P., red.; YERKHOVA, Ye.A.,  
tekhn. red.

[Principles of studying balance sheets and statistics]Osnovy  
balansovedeniia i statistiki; uchebnoe posobie. Pod red.  
N.R.Veitsmana. Moskva, Izd-vo IMO, 1962. 261 p.  
(MIRA 15:12)

(Accounting)

(Statistics)



GRACHEV, Nikolay Pavlovich; GRIGOR'YEV, Yuriy Alekseyevich; MUKHIN,  
Aleksandr Fedorovich; KAKHOVSKAYA, O.G., red.izd-va; VEYTSMAN, N.R., red.;  
PAVLOVSKIY, A.A., tekhn. red.

[Accounting in the foreign trade of the U.S.S.R.] Uchet vo  
vneshnei trgovle SSSR. Moskva, Vneshtorgizdat, 1962. 300 p.  
(MIRA 16:2)

(Accounting) (Russia—Commerce)

KABAKOV, G.I.; MUKHIN, A.G.

Machine for the automatic loading of rods into a mill. Obog. rud  
6 no.2:48-49 '61. (MIRA 14:8)  
(Crushing machinery) (Materials handling)

MUKHIN, A. I.

USSR/ Physics - Nuclear cross section

Card 1/1 Pub. 22 - 12/46

Authors : Ignatenko, A. Ye; Mukhin, A. I.; Ozerov, E. B.; and Pontekorvo, B. M.

Title : Total cross-sections of the interaction between the negative  $\pi$ -mesons and hydrogen in the energy range from 140 up to 400 Mev

Periodical : Dok. AN SSSR 103/1, 45-47, Jul 1, 1955

Abstract : Experimental studies of the total cross-sections of the interactions between negative  $\pi$ -mesons and protons (hydrogen) are described. The experiments were conducted at the Institute of Nuclear Problems of the Acad. of Sc., USSR. Measurements of the cross-sections were carried out in the energy areas from 140-400 Mev. The measurements were conducted by the method of differences ( $\text{CH}_2\text{-C}$ ). Five references: 2 USSR and 3 USA (1952-1954). Diagrams; table.

Institution : Acad. of Sc., USSR, Institute of Nuclear Problems

Presented by: Academician L. A. Artsymovich, May 17, 1955

MUKHIN, A. I.

USSR/ Physics - Nuclear physics

Card 1/1 Pub. 22 - 9/45

Authors : Ignatenko, A. Ye.; Mukhin, A. I.; Ozerov, Ye. B.; and Pontekorvo, B. M.

Title : Full cross-sections of the interaction between negative  $\pi$ -mesons and deuterium in the energy region between 140 and 400 Mev.

Periodical : Dok. AN SSSR 103/2, 209-212, Jul 11, 1955

Abstract : Experiments intended to obtain more precise data on the full cross-section of negative  $\pi$ -mesons and deuterium reactions ( $\pi, d$ ) are described. The experiments were conducted in the range of energy between 140 and 400 Mev. Ten references: 1 French, 3 USSR, and 6 USA (1952-1955). Tables; graphs.

Institution : The Acad. of Sc., USSR, Institute of Nuclear Physics

Presented by : Academician L. A. Artsimovich, May 17, 1955

MUKHIN-A.I.

639.173  
 317. THE INTERACTION OF NEGATIVE  $\pi$ -MESONS  
 WITH NUCLEI OF BERYLLIUM, CARBON AND OXYGEN IN  
 THE ENERGY RANGE FROM 140 TO 400 MeV. A.N. Ignatenko,  
 A.I. Mukhin, E.B. Ozerov and B.M. Pontakorn (Pontacorno).  
 SOV. PHYS. NUKL. 8:688, Vol. 103, No. 3, 395-7 (1955). In  
 Russian.  
 Gives the results of an investigation of the energy depend-  
 ence of total cross-sections for the interaction of  $\pi^-$ -mesons  
 with these three elements. Scintillation counters were used to  
 measure the attenuation of a  $\pi^-$ -meson beam, with the arrange-  
 ment described in a previous paper (Abstr. 8141/1955). The  
 measured cross-sections were corrected for  $\mu^-$ -meson admix-  
 ture, chance coincidences, miscounting, small-angle scatter-  
 ing and secondary particles, and the results are tabulated to-  
 gether with the corresponding errors. The total cross-section  
 is found to have a flat maximum from 140 to 230 MeV, decreas-  
 ing sharply on each side of this range. J.B. Sykes

3

pm 4-24



MUCHIN, A.I.

SUBJECT  
AUTHOR

TITLE

PERIODICAL

USSR / PHYSICS

IGNATENKO, A.E., KRIVICKIJ, V.V.,

REUT, A.A., TARAKANOV, K.I.

The Leading-Out of Bundles of Energy-Rich Particles through the Pole Shoes of the Electromagnet of a Phasotron.

Atomnaja Energiya, 1, fasc.5, 5-8 (1956)

Issued: 1 / 1957

CARD 1 / 2

PA - 1751

MUCHIN, A.I., PONTEKORVO, B.,

The present paper describes the method for the production of collimated pion bundles which was developed in the summer of 1953. On this occasion the pole shoes of the electromagnet serve as the main protection against the direct radiation of the accelerator. Apart from the economic advantage offered, the application of pole shoes as protection against radiation permits a considerable increase of the operation surface for investigations. In the 6 m phasotron of the Institute for Nuclear Problems of the Academy of Science in the USSR the properties of mesons are investigated on bundles which are led out not only through and between the pole shoes, but also through a specially built "principal concrete protection" of the phasotron. However, this concrete protection is comparatively far away from the chamber of the accelerator, and therefore the meson bundles led through the pole shoes are more intense than the bundles led out through the principal concrete protection.

The leading out of monoenergetic pion bundles through the pole shoes of the phasotron magnet is discussed on the basis of a drawing. The mesons produced by the bombardment of the target (arranged in the accelerator chamber) with 680 MeV

MURKIN, #1.

500  
Page 1

Total cross sections of interaction of positive  $\pi$  mesons with hydrogen. A. R. Ignatenko, A. I. Mikhlin, E. M. Ozerov, and B. M. Pontecorvo. Zhur. Eksp. i Teor. Fiz. 30, 7-11(1956).

The total cross sections of interaction of pos.  $\pi$  mesons with H were detd. by attenuation in liquid H. From the combined measurements of total cross sections of  $\pi^+$  mesons with H and with D a contribution to the cross section by states with different isotopic split were obtained in the 140-230-m.e.v. region. The length of the scatterer was 28 cm., corresponding to the surface d. of H 1.07 g./sq. cm. In addn. to the previously described sector (C.A. 50, 7814c) Cherenkov detector, poly(methyl methacrylate) and polyethylene filters were used to absorb protons. Total uncertainty in energy measurements (including the slowing down of mesons in H, errors in measuring energy, and initial and max. probability of heterogeneity in the meson beam) was  $\pm 6$  m.e.v. For  $\pi^+$  mesons with energy (m.e.v.) 140  $\pm 7$ , 144  $\pm 6$ , 164  $\pm 6$ , 174  $\pm 6$ , 184  $\pm 6$ , 194  $\pm 6$ , 209  $\pm 10$ , 210  $\pm 6$ , 220  $\pm 6$  the following total cross sections (mb.) were obtained, resp.: 133  $\pm 8$ , 151  $\pm 4$ , 162  $\pm 5$ , 183  $\pm 6$ , 196  $\pm 6$ , 200  $\pm 6$ , 170  $\pm 6$ , 160  $\pm 7$ , 133  $\pm 7$ .

A. P. Kallolov



MUKHIN, A.I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1615  
AUTHOR MUCHIN, A.I., OZEROV, E.B., PONTEKORVO, B.  
TITLE The Scattering of  $\pi^-$  Mesons by Hydrogen. I. Angular Distribution  
at energies of 176, 200, 240, 270 and 307 MeV.  
PERIODICAL Zhurn.eksp.i teor.fis, 31, fasc.3, 371 - 385 (1956)  
Issued: 12 / 1956

The present report contains an exact discussion of the results obtained by A.I. MUCHIN, E.B. OZEROV, B. PONTEKORVO ( report of the Institute for Nuclear Problems of the Academy of Sciences of the USSR, 1955, lectures delivered on the All Soviet Conference on the Physics of high-energy particles, 14 - 22 May 1956) concerning the scattering described in the above title. Measuring was carried out by means of scintillation counters. The bundles of positive pions were produced by the bombardment of a polyethylene target by the proton bundle leaving the synchrocyclotron. The corresponding reaction is  $p + p \rightarrow \pi^+ + d$ .

Test order: For measuring angular distributions a ČERENKOV detector and liquid-scintillation-counters were used, which were connected in coincidence for the registration of positive pions inciding upon the hydrogen target. The total cross sections of the interaction between positive pions and hydrogen were measured from the decrease of intensity of the meson bundle passing through the hydrogen scatterer. There follows a discussion of measurements carried out.

Measuring results: Measuring results are shown in tables. The differential cross sections in the laboratory system and in the center of mass system and, in addition,

Žurn.eksp.i teor.fis, 31, fasc.3, 371 - 385 (1956) CARD 2 / 2

PA - 1615

the following parameters are concerned: The factor  $K$ , which characterizes the bundle, the effective space angle  $\Omega$ , and the degree of efficiency  $\varepsilon$  of the registration of the mesons under the angle  $\theta$ . The amount of occurring errors is discussed. The experimental data for the meson energy of 307 MeV are best approximated by a function of the type  $d\sigma/d\Omega = a_0 + a_1 P_1(\cos \theta) + a_2 P_2(\cos \theta) + a_3 P_3(\cos \theta) + a_4 P_4(\cos \theta)$ . Therefore the processes of meson-nucleon scattering are probably no longer well described by S- and P-waves alone. The importance of the contribution made by D-waves will be evaluated later. A further table contains the coefficients of the angular distribution which were found by means of the method of the smallest squares; angular distribution was approximated by a function with 5 free parameters. Also the values of the total cross sections were shown together in a table. In a diagram the curves of the energy dependence of the total cross section  $\sigma_t(\pi^+, p)$  obtained by the decrease of intensity of the bundle as well as of the cross sections obtained by integration of the differential cross sections are compared with one another. Agreement is good and a certain deviation was found only at 200 MeV.

INSTITUTION : Institute for Nuclear Problems of the Academy of Sciences of the USSR.

MUKHIN, A. I.

MUKHIN, A. I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1867  
AUTHOR IGNATENKO, A.E., MUCHIN, A.I., OZEROV, E.B., PONTEKORVO, B.  
TITLE The Interaction between Pions and the Nuclei of Lead, Copper,  
Carbon and Beryllium.  
PERIODICAL Zhurn. eksp. i teor. fis., 31, fasc. 4, 545-549 (1956)  
Issued: 1 / 1957

The present work at first deals with the results obtained by measuring the cross sections  $\sigma_{ne}$  of the nonelastic collisions between negative pions and Be-, C-, Cu- and Pb-nuclei in the energy interval of from 140 to 400 MeV and then discusses them in connection with the corresponding total cross sections  $\sigma_t$ . The nonelastic cross sections were measured by measuring the attenuation of the meson bundle passing through a scatterer by the method of scintillation counters. Measuring results are shown in a table. The necessary corrections are discussed. A diagram illustrates the found energy dependence of the nonelastic cross sections and compares them with the nonelastic cross sections measured previously by means of scintillation counters at energies of less than 140 MeV. The energy dependence of the nonelastic and total cross sections of these nuclei in general reminds us of the energy dependence of the total cross sections of the scattering of pions by hydrogen and deuterium. At energies of from 100 to 250 MeV the cross sections depend only slightly on energy, but above 250 MeV cross sections diminish comparatively quickly. Also at energies below 100 MeV cross sections diminish comparatively quickly.  $\sigma_t$  and  $\sigma_{ne}$  attain their maximum within that energy domain

Žurn.eksp.i teor.fiz, 31, fasc.4, 545-549 (1956) CARD 2 / 2 PA - 1867

(~ 190 MeV), in which also the total cross sections of the scattering of pions by hydrogen and deuterium attain their maxima. For the purpose of determining data concerning the energy dependence of the range  $\lambda = f(E)$  the here obtained data on  $\sigma_{ne}$  were analyzed (on the basis of the optical model).

The here obtained ranges are shown in a diagram and correspond at all energies to the nonelastic cross sections of Be and C. The range may be computed also from the data on the cross sections of interaction between pions and free nucleons; a corresponding formula is given. The ranges determined by these two methods agree with one another at energies of more than 200 MeV. Therefore, pions probably enter into interaction with the individual nucleons of the nucleus. The computed and measured energy dependence of the total cross section are in good agreement. From the analysis of the here discussed results it follows that the optical model, if suitable parameters are used (which were computed from the mechanism of the one-nucleon interaction of mesons with nuclei) describes the energy dependence of the total and non-elastic cross sections for Be, C, Cu and Pb at from 140 to 400 MeV satisfactorily. From the values of  $\sigma_t$  and  $\sigma_{ne}$  it is possible to obtain data concerning nuclear dimensions.

INSTITUTION: Institute for Nuclear Problems of the Academy of Science in the USSR

MUKHIN, A.I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1734  
AUTHOR MUCHIN, A.I., PONTEKORVO, B.  
TITLE The Scattering of Positive Pions by Hydrogen. II. Judgment and Interpretation of Results.  
PERIODICAL Zhurn.eksp.i teor.fis, 31, fasc.4, 550-559 (1956)  
Issued: 1 / 1957

This work (the continuation of A.I.MUCHIN et al., Zhurn.eksp.i teor.fis, 29, 371 (1955)) investigates the data on the scattering of positive mesons with and without the condition that the contribution made by D-states towards scattering be very small. If D-states are neglected, interaction occurs only in S- and P-states (S-P-analysis), but if they are not neglected, S-P-D-analysis is necessary. The latter condition is sensible in the case of energies of  $\sim 300$  MeV. If S-, P-, and D-waves participate in the scattering of positive pions, it is found that, in addition to the three phase shifts  $\alpha_3$ ,  $\alpha_{31}$  and  $\alpha_{33}$  (which characterize interaction in the S-,  $P_{1/2}$  and  $P_{3/2}$ -state with the isotopic spin  $3/2$ ) also the phase shifts  $\delta_{33}$  and  $\delta_{35}$  (which correspond to the D-states with the total angular momentum  $3/2$  and  $5/2$ ) are different from zero.

Some conclusions drawn from this work and from the previous work cited above: The phase shifts  $\alpha_{33}$  are practically equal in the case of S-P- and S-P-D-analysis.  $\alpha_{33}$  probably passes through  $90^\circ$  at an energy of  $> 176$  MeV. The

Žurn.eksp.i teor.fis,31,fasc.4,550-559 (1956) CARD 2 / 2

PA - 1734

values obtained for  $\alpha_3$  are incompatible with OREAR'S equation  $\alpha_3 = -0,11\eta$  at energies of 240, 270, and 307 MeV. However, this equation is well suited for low energies if data are described only by  $\alpha_3$ ,  $\alpha_{31}$  and  $\alpha_{33}$ . However, in consideration of the data for 307 MeV an S-P-D-analysis is hardly necessary for describing the data obtained here. The "optimum" values of the phase  $\alpha_{31}$  become regular at energies  $> 200$  MeV of the mesons.  $\alpha_{31}$  is negative and apparently remains below  $10^\circ$  up to 310 MeV.  $\alpha_{31}$  becomes smaller if data are expressed by 5 phase shifts. The "optimum" phase shifts of the D-waves  $\delta_{33}$  and  $\delta_{35}$  are positive and negative respectively. With increasing energy the phases tend towards an increase. In S-P-D-analysis the values of the S-phase  $\alpha_3$  decrease considerably in comparison to the corresponding values obtained by S-P-analysis. If the possible contribution made by D-waves is taken into account,  $\alpha_3$  depends linearly or nearly linearly on the momentum of the meson up to 310 MeV. The radius of meson-nucleon interaction in any case amounts to  $\sim 7 \cdot 10^{-14}$  cm, no matter whether S- and P-waves suffice for describing scattering or not. The real part of the amplitude of scattering in a forward direction obtained from the causality conditions is in good agreement with its description by the phase shifts up to 310 MeV.

INSTITUTION: Institute for Nuclear Problems of the Academy of Science in the USSR.

MUKHIN, A.I. OZEROV, E.B., PONTEKORVO, B.M., GRIGORYEV, E.L., MITIN, N.A.

"Positive Pion-Proton Scattering at Energies 176, 200, 240, 270, 307 and 310 MeV," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

MUKHIN, A. I.

MUKHIN,

3004

THE SCATTERING OF  $\pi^+$ -MESONS ON HYDROGEN. I. ANGULAR DISTRIBUTIONS AT ENERGIES OF 176, 200, 240, 270, AND 307 MEV. A. I. Mukhin, Z. B. Ozerov, and B. Postegorye (Academy of Sciences, USSR). Soviet Phys. JETP 4, 237-39 (1957) March.

The angular distribution of  $\pi^+$  mesons with energies of 176, 200, 240, 270 and 307 Mev scattered from liquid hydrogen has been studied with the help of scintillation counters. The total interaction cross section  $\pi^+$  mesons and hydrogen has also been measured by the method of attenuation of the beam. At all energies, except 307 Mev, the data can be well described by a function of the form  $d\sigma/d\Omega = a + b \cos \theta + c \cos^2 \theta$ . (auth)



[illegible]

Measurements were made of the total cross sections  $\sigma_{\text{tot}}$  for interaction of  $\pi^+$  mesons with Be, C and Cu at a half of cross sections  $\sigma_{\text{tot}}$  for isotropic collisions of  $\pi^+$  mesons with Be, C, Cu and Pb in the energy range from 10 to 100 Mev. Cross sections were measured at angles  $\theta$  using the assumption of a plane wave approximation for the incident beam, using calculations of  $\sigma_{\text{tot}}$  taking into account the energy dependence of the total scattering cross section of pions on hydrogen and deuterium. Results of the cross section measurements were analyzed on the basis of the optical model. It was concluded as a result of the calculations that the optical model is not applicable to the calculation of the cross sections of  $\pi^+$  mesons on Be, C and Cu at angles  $\theta$  in the energy range from 10 to 100 Mev.

12931

SCATTERING OF  $\pi^+$  MESONS BY HYDROGEN. II. THE  
CUSHION AND INTERCUSHION

A. I. MURIN and R. S. FOMIN, SOVIET JOURNAL OF NUCLEAR  
PHYSICS, 1970, 12, 1, 1-10, 11 figs.

A phase analysis is made of the data obtained on scattering by hydrogen of  $\pi^+$  mesons of different energies up to 207 Mev. The analysis was carried out using a high-speed electronic computer. On the assumption that the scattering process can be sufficiently accurately described by S- and P-waves (S-P-analysis), as well as on the assumption that the scattering process must be described by five parameters (S-P-D-analysis). The energy dependence of the various phase shifts obtained for the (S-P-) and (S-P-D-) analyses are shown. It follows from the measurements that the radius of meson-nucleon interaction is about  $7 \times 10^{-14}$  cm. (auth)

MUKHIN, A. I.

9147

THE EXTRACTION OF HIGH-ENERGY PARTICLE BEAMS  
THROUGH THE YOKE OF THE SYNCHROCYCLOTRON <sup>19</sup>  
ELECTROMAGNET / A. B. Ignatyenko, V. V. Krivitskiy,  
A. I. Mukhin, B. P. Pospelov, A. A. Ruet, and K. I.  
Bardakov. J. Nuclear Energy B, No. 1, 57-61(1967).

A method is described for obtaining collimated beams of  
high-energy particles, in particular  $\pi$  mesons, based on the  
use of the electromagnet yoke as the main shield from the  
direct radiation of the accelerator. By placing collimators  
in channels drilled in the electromagnet yoke, beams of  
 $\pi$  mesons with energies up to 400 Mev have been obtained.  
(auth)

10  
1-454c  
1-bml

BML

144

JP

MUKHIN, A. I.

6486

MESON-NUCLEON PHASE SHIFTS OF SCATTERING IN  
ENERGIES UP TO 210 MEV. A. I. Mukhin, I. V. Popova,  
and G. N. Tentyukova. Doklady Akad. Nauk S.S.S.R. 112,  
238-2 (1957) Jan. 11. (in Russian)

Studies were made of meson-nucleon scatterings at  
~ 200 to ~ 300 Mev with the purpose of observing meson  
interactions with protons in S, P, and D states. Analytical  
data are given on  $\pi^+$  meson scattering on hydrogen with  
the assumption that its contribution to scattering in D  
states is negligibly small, i.e. that the scattering occurs

only in S and P states (S-P analysis) and with the assump-  
tion that its contribution to D states is considerable (S-P-D  
analysis). The tables for both S-P and S-P-D analysis and  
diagrams of the angular distribution of  $\pi^+$  mesons elasti-  
cally scattered on hydrogen are presented. (R.V.J.)

pmL  
NTT

MUKHIN, A. I., OSEROV, E.B., and PONTECORVO, B.

"Energy Dependence ~~at~~ of the ~~π~~ Asymmetry in  $(\pi^+e^+)$  Decay,"

paper presented at Annual International Conference on High Energy Physics,  
CERN, Geneva, 30 Jun - 5 Jul 58.

*Joint Inst. Nuclear Research*

21 (0)

AUTHORS: ~~Mukhin, A. I., Ozerov, Ye. B.,~~  
Pontekorvo, B.

SOV/56-35-2-5/60

TITLE: The Energy Dependence of Asymmetry in  $\mu^+e^+$ -Decay  
(Energeticheskaya zavisimost' asimmetrii v  $\mu^+e^+$ -raspade)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 2, pp 340-347 (USSR)

ABSTRACT: For the investigation of the asymmetry of electrons produced during the decay of polarized  $\mu$ -mesons the authors developed an experimental system which is described in the following. The  $\pi$ -meson bundles used for the experiments are from a synchrocyclotron, the energy of the  $\pi$ -mesons amounted to  $\sim 80$  MeV, and intensity amounted to  $100 \text{ mesons/cm}^2 \text{ sec.}$  The experimental arrangement consisted of a shielding wall, a collimator with a beryllium filter in the gap, before it the two monitor counters (between the counters there is a polyethylene filter of 10 cm thickness), the graphite target (with magnetic shield), and of a telescopic arrangement of scintillation counters with  $\text{CH}_2$ -filters. The results

Card 1/2

The Energy Dependence of Asymmetry in  $\mu^+e^+$ -Decay

SOV/56-35-2-5/60

obtained by the investigations ( $\pi\mu e$ -decay) are represented in form of 2 diagrams. (Figure 3 shows the absorption of the electrons originating from the decay of unpolarized  $\mu^+$ -mesons; figure 4 shows the dependence of the asymmetry-coefficient on electron energy). The qualitative results of the energy dependence agree (with a margin of some few %) with those predicted by the two-component neutrino theory. The degree of polarization of the  $\mu$ -mesons was determined as amounting to  $0,81 \pm 0,11$ . There are 4 figures and 13 references, 2 of which are Soviet.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)

SUBMITTED: March 3, 1958

Card 2/2

21(7)

AUTHORS:

Balandin, M. P., Moiseyenko, V. A.,  
Mukhin, A. I., Otvinovskiy, S. Z.

SOV/56-36-2-12/63

TITLE:

Investigation of  $\pi^+ - \mu^+ - e^+$ -Decay by Means of a Propane Bubble Chamber and Scintillation Counters

(Issledovaniye  $\pi^+ - \mu^+ - e^+$ -raspada pri pomoshchi propanovoy puzyr'kovoy kamery i stsintillyatsionnykh schetchikov)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,  
 Vol 36, Nr 2, pp 424-432 (USSR)

ABSTRACT:

After the discovery of the nonconservation of parity in the case of weak interaction (Refs 1, 2) the results of a number of investigations of  $\mu$ -e-decay were published, which were carried out partly by means of electronic particle recording (Refs 3, 4) and partly with photoemulsions (Refs 5, 6). In 1957 reports were published concerning also investigations carried out by means of hydrogen- (Ref 7) and propane bubble chambers (Refs 8, 9). The advantages and disadvantages of these methods are discussed in short in the introduction. The authors of the present paper also used a propane bubble chamber for the purpose of recording particles. The present paper intends to investigate

Card 1/4



Investigation of  $\pi^+ - \mu^+ - e^+$ -Decay

SOV/56-36-2-12/63

by Means of a Propane Bubble Chamber and Scintillation Counters

positron asymmetry in the reaction  $\pi^+ - \mu^+ - e^+$ . The asymmetry found by the authors turned out to be considerably less than that found by other research workers. (Refs 4, 10, 11), who had also used propane for their work. The difference is explained by the difference in the purity of the propane used. A scheme of the experimental arrangement used is shown by figure 1. The 670 Mev proton beam emitted from the synchrocyclotron penetrates a lead shield and is focused by quadrupole lenses; behind a further shield is the polyethylene target in which the  $\pi^+$ -mesons are produced. According to the thickness of this target (70 or 30 cm), the  $\pi^+$ -meson beam deviates from the primary proton beam by 7 or 30°, and the  $\pi^+$ -mesons have an energy of 170 or 273 Mev. Behind a further shield, the meson beam is electromagnetically deflected and penetrates a steel collimator, which is let in to the window of the 4 m-concrete shield, which is lined with cast iron plates. The beam finally reaches a filter (at 170 Mev made from 29 cm Al, at 273 Mev 15.5 cm Cu) and finally penetrates into the bubble chamber, which is screened off by means of double-layer iron. The tracks of the charged particles were photographed by means of a stereophotographic camera

Card 2/4

Investigation of  $\pi^+-\mu^+-e^+$ -Decay  
by Means of a Propane Bubble Chamber and Scintillation Counters

SOV/56-36-2-12/63

fitted with a "Yupiter-8" lens ( $F=5.24$  cm). The chamber was filled with technical propane (80% propane, 10% propylene, 6% methane, 4% butane); the normal operational conditions of the chamber were:  $62^\circ\text{C}$ , primary pressure 32 atm, expansion 2.6%. About 5000 stereophotographs were taken. All plates were twice investigated. As a result of the first investigation, 6712

cases of  $\pi^+-\mu^+-e^+$ - and  $\mu^+-e^+$ -decays (as well as some doubtful cases) were found, and the second disclosed an additional number of 346 such cases. Figure 3 shows the angular distribution of the latter, which is found to be independent of  $\theta$ . Investigation of the angular distribution of  $\mu^+$  mesons in 4107 cases of  $\pi^+$ -decays gave a result which is shown by figure 4. The angular distribution of positive muons in "doubtful" cases is shown by figure 5, as  $N(\beta')$ . The results obtained by the investigation of the angular distribution of

positrons from the  $\pi^+-\mu^+-e^+$ -decay  $f(\theta')$  in 5252 cases is shown by figure 6; figure 7 shows the corresponding result for doubtful cases. It was found that the angular distribution of

Card 3/4

$\mu^+$ -mesons is isotropic, whereas positron angular distribution,

Investigation of  $\pi^+ - \mu^+ - e^+$ -Decay

SOV/56-36-2-12/63

by Means of a Propane Bubble Chamber and Scintillation Counters

if described by  $\frac{1}{4\pi}(1 - a \cos \theta)$ , is characterized by

$a = 0.116 \pm 0.035$ , a value that is much lower than those obtained by others. The authors further investigated asymmetry by means of scintillation counter experiments (Fig 9) in order to find the reason for the low  $a$ -value. It was found to be due to the difference in the degree of propane purity. A simultaneous analysis of the data obtained with propane of a given composition was carried out by means of a bubble chamber and scintillation counters, and resulted in  $\lambda(1 - W_C) = 0.78 \pm 0.26$ , where  $W_C$  denotes the depolarization probability of  $\mu^+$ -mesons in graphite and  $\lambda$  a fundamental parameter of the neutrino theory. The authors finally thank B. M. Pontekorvo for supervising work, M. Ya. Danysh, A. A. Tyapkin and N. A. Chernikov for their help and advice, and R. M. Ryndin and S. M. Bilen'kiy for discussions; they further thank B. S. Neganov, V. A. Zhukov and B. D. Balashov as well as V. Trifonov and G. Murin for taking part in the work. There are 9 figures and 17 references, 7 of which are Soviet.

ASSOCIATION: Ob'yedinennyi institut yadernykh issledovaniy  
(United Institute for Nuclear Research)

SUBMITTED: August 28, 1958  
Card 4/4

MUKHIN, Adolf I.

"On the Intensity of the Nonradioactive Transition in Mesic Atoms of Pb,  
Bi, Th,  $U^{235}$  and  $U^{238}$ "

paper presented at the Intl Conference on High Energy Physics, Rochester, N. Y.  
and/or Berkly California, 25 Aug - 16 Sep 1960.

Joint Inst. for Nuclear Reserch, Dubna, USSR

ACCESSION NR: AP4037616

S/0056/64/046/005/1919/1920

AUTHORS: Zinov, V. G.; Konin, A. D.; Mukhin, A. I.

TITLE: Transfer negative muon from a proton to carbon

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1919-1920

TOPIC TAGS: muon, muon transfer, muon K capture, carbon, polyethylene, x ray line

ABSTRACT: The transfer of muons to only excited levels of a  $Z\mu$ -mesic atom with further cascade transition of the system to the ground state, followed by emission of a K-mesic x-ray series, which can be useful in the study of reverse mesic-atom processes that occur in compounds or mixtures containing hydrogen, was investigated by comparing the intensities of the K series from mesic atoms of carbon, produced when negatively charged muons are stopped in carbon (graphite) and in polyethylene ( $\text{CH}_2$ ). The data indicate that if it is as-

Card 1/3

ACCESSION NR: AP4037616

sumed that the probabilities of the muons landing on C and H are proportional to their charges, then the muons which jump over from the proton to the carbon in the cascade transitions give a K-mesic x-ray series whose intensity is  $0.98 \pm 0.03$  of the intensity occurring in the case of direct landing of the muons on the carbon. "The authors are grateful to S. S. Gershteyn for discussions."

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(Joint Institute of Nuclear Research)

SUBMITTED: 26Feb64

DATE ACQ: 09Jun64

ENCL: 01

SUB CODE: NP

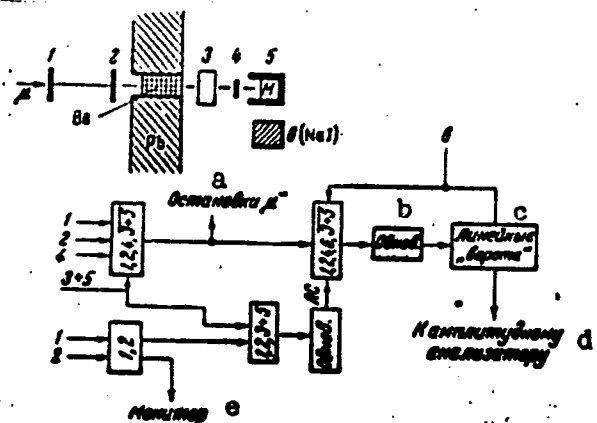
NR REF SOV: 003

OTHER: 001

Card 2/3

ACCESSION NR: AP4037616

ENCLOSURE: 01



Experimental set-up and block diagram of the electronic circuitry: Pb - lead shield, Be - beryllium filter, M - sample (C or CH<sub>2</sub>), 1, 2, 4, 5 - counters with plastic scintillators, 3 - counter with Cerenkov radiator, a - muon stopping radiator, b - univibrator, c - linear gates, d - to pulse-height analyzer, e - monitor

Card 3/3

E 20208-65 EWT(m)/EPA(w)-2/EWA(m)-2 Pb-4/Pab-10 IJP(c)/AFWL/  
SSD/BSO/ASD(a)-5/AFMDC/AFETR/ESD(t)  
ACCESSION NR: AP4038551 S/C053/64/083/001/0183/0190

AUTHOR: Gramenitskiy, I. M.; Maksimenko, V. M.; Mukhin, A. I. B

TITLE: Ninth international conference on high energy physics

SOURCE: Uspekhi fizicheskikh nauk, v. 83, no. 1, 1964, 183-190

TOPIC TAGS: cosmic ray, high energy particle, pion, muon, muon capture, nucleon interaction, K meson

ABSTRACT: The Ninth international conference of Soviet-block experts on high-energy physics was held in Krakow, Poland on 24--26 September 1963 and was devoted essentially to interactions of nucleons and nuclei with particles of energies ranging from several to several hundred GeV. Three sessions were devoted to accelerator results, two to cosmic ray results, one to methods, and one to individual problems in the theory of high-energy particle interactions. It was attended by 111 scientists (Acad. Sci. SSSR - 9, Joint Inst. of Nuc. Res. - 10, Bulgaria - 4, Hungary - 5, DDR - 9, China - 2, Poland - 60, Rumania - 6, and Czechoslovakia - 6). The conference was opened by Prof. M. Miesowicz, followed by a large survey paper by Ye. L. Feynberg (see

Card 1/4



L 20208-65

ACCESSION NR: AP4038 551

16

Ye. L. Feynberg and D. I. Chernavskiy, UFN v. 82 (1), 3, 1964). The reported papers are: G. I. Budker (Novosibirsk) - on the small high-current accelerator. A. I. Mukhin (Dubna) - muon capture by nuclei. Yu. M. Kazarinov (Dubna) - phase shift analysis of NN scattering. V. S. Yevseyev et al. - capture of polarized  $\mu$  mesons by  $\text{Ca}^{40}$ . O. A. Zaymioroga et al. - nuclear capture of muons in  $\text{He}^3$ . Yu. M. Kazari-  
no et al. - elastic NN interaction below 1 GeV. I. Suchozzewska, Ga-  
jewski, and E. Zakrzewski (Warsaw) - several communications on fragme-  
nts and hyperfragments. T. Visky (Bucharest) - production of subbar-  
rier positive pions. T. Hofmoki (Warsaw) - interaction of 3.0 GeV/c  
antiprotons with protons. K. Lanmus (Berlin) -  $\pi^+p$  interaction at  
4.0 GeV/c. M. Bardadin (Warsaw) -  $\pi^-p$  interactions with  $n \approx 6$  char-  
ged particles at 9.9 GeV/c. A. Eskrajs (Krakow) - secondary stars  
due to neutrons in hydrogen bubble chamber bombarded by 10.6-GeV/c  
 $\pi^+$  mesons. I. Vrana (Prague) -  $\pi^-N$  interaction at 7 GeV. I. Klugow  
(Berlin) - neutral pion production in  $\pi^-N$  interactions. A. Mihul  
(Bucharest) -  $\pi^-p$  reaction at low momentum transfer. E. Balia (Bucha-

Card 2/4

L 20208-65

ACCESSION NR: AP4038551

19

rest) - analysis of  $\pi^-p$  interaction at 7 GeV. E. Loskiewicz (Krakow)  
- production of neutral pions in xenon bubble chamber by 9 GeV/c  $\pi^-$   
mesons. I. N. Gremenitskiy (Dubna) - generation of neutral pions by  
negative pions in the Coulomb field of the xenon nucleus; scattering  
of negative pions by quasi-free neutrons and charge exchange of negative  
pions by quasi-free protons. R. Sosnowski (Warsaw) - production of  
strange particles in  $\pi^-p$  interactions. E. Bartke (Krakow) - strange  
particle production by 16 GeV/c negative pions. V. I. Moroz (LVE  
OIYaI, Dubna) - possible system of isobar states and their transition  
schemes. E. Skrzypczak (Warsaw) - interaction between 24 GeV protons  
and 17 GeV pions. Prof. M. Miesowicz, Prof. E. Gierula, S. Krzywd-  
zinski, and K. Zaleski (Krakow) - several reports on nuclear inter-  
actions in emulsions exposed on balloons at high altitudes. V. M.  
Maksimenko (report of FIAN group headed by N. A. Dobrotin) - momentum  
spectrum of secondary pions generated in interactions with average  
energy 220 GeV. S. A. Slavatskiy and I. N. Fetisov (same FIAN  
group) - upper limit of  $K^0$  meson and hyperon production in interac-  
tions with nucleons of average energy 300 GeV. V. Ya. Shestoporov  
(report of group headed by N. L. Grigorev, Moscow, MGU) - inelastic

Card 3/4

L 20208-65  
ACCESSION NR: AP4038551

8

interactions between nucleons and nuclei at  $\bar{x} 10^{12} - 10^{13}$  eV. Yu. A. Smorodin et al. (Moscow, FIAN) - results of production of electron-photon cascades in air at  $5 \times 10^{10} - 10^{13}$  eV. N. M. Nesterova (group headed by A. Ye. Chudakov, Moscow, FIAN) - primary cosmic radiation and search for high-energy photons. A. Zawadski (Lodz) - same but with a different procedure. B. A. Khrenov (report of group headed by S. N. Vernov) report of comprehensive study of extensive air showers. N. I. Nesterova and S. I. Nikol'skiy - possibility of deducing primary radiation composition from fluctuations of the relative intensity of a Cerenkov flash due to an extensive air shower with specified particle number. Orig. art. has 3 figures, 19 formulas, and 2 tables.

SUBMITTED: 00

ENCL: 00

SUB CODE: NP

NR REF SOV: 001

OTHER: 000

Card 4/4

L 23257-66 EWT(m)/T

ACC NR: AP6009154

SOURCE CODE: UR/0367/65/002/005/0859/0867

AUTHOR: Zinov, V. G.; Komin, A. D.; Mukhin, A. I.ORG: Joint Institute of Nuclear Research (Ob'yedinenyy institut yadernykh issledovaniy)TITLE: Atomic capture of negative muons in chemical compounds

SOURCE: Yadernaya fizika, v. 2, no. 5, 1965, 859-867

TOPIC TAGS: Mu meson, capture cross section, chemical compound, Pi meson, electron, oxide, probability

ABSTRACT: The authors investigated the atomic capture of negative muons in binary compounds of the type  $A_nB_m$ . Whereas earlier experimental work on the determination of the probability of atomic capture in chemical compounds was based on the method of time analysis, which entails considerable difficulties, the authors have used an experimental procedure based on measurement of the intensity of the K-mesic x ray series from one of the elements in pure form, and from the same element in the chemical compound. The work was performed with the OIYaI synchrocyclotron, using a beam of negative particles of 150 Mev/c momentum, containing approximately equal amounts of pions, muons, and electrons (Fig. 1). The characteristics of the apparatus are described in detail. The results show that the ratio of the pro-

Card 1/2

L 23257-66

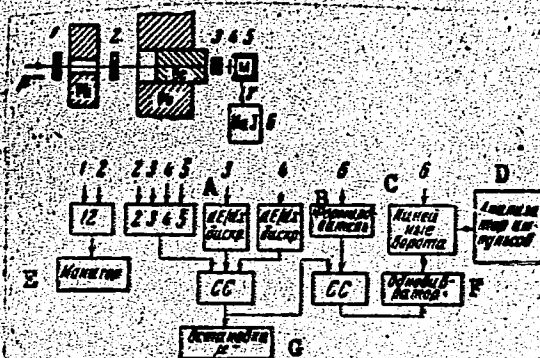
ACC NR: AF6009154

babilities of the atomic capture of muons in oxides varies with increasing charge of the nucleus in accordance with the periodic table, and depends on the type of the compound ( $MgO$  and  $MgO_2$ , etc.). The ratio of probabilities of the atomic capture in metal halides and in alloys of metals is satisfactorily described by the linear relationship  $0.66(Z_1/Z_2)$ . The authors thank L. A. Yutlandov for supplying numerous chemical compounds and their purification, Yu. G. Budayshov, B. Yu. Semenov, A. N. Sinyayev, N. S. Erolov, Ts'ao Kuo-cheng for help in preparing the apparatus and with the measurements, and S. S. Gershteyn, L. I. Ponomarev, and V. G. Firsov for a discussion of the results. Orig. art. has: 7 figures, 3 formulas, and 2 tables.

SUB CODE: 20/  
Card 2/2

SUBM DATE: 28 May 65/

Fig. 1. Geometry of experiment and block diagram of electronic equipment. A - Discriminator, B - shaper, C - linear gates, D - pulse analyzer, E - monitor, F - vibrator, G - muon stopping, CC - coincidence circuit.



ZINOV, V.G.; KONIN, A.D.; MUKHIN, A.I.

Transition of a negative  $\pi^-$ -meson from a proton to carbon.  
Zhur. eksp. i teor. fiz. 46 no.5:1919-1920 My '64.

(MIRA 17:6)

1. Ob'yedinennyy institut yadernykh issledovaniy.

MUKHIN, A.I.; SILAYEV, Ye.D.; AVDEICHEV, L.A.; BODRIN, V.V.; TIKHOMIROV,  
V.P., otvetstvennyy red.; ASOYAN, N.S., red.; CHIZHOV, N.M., red.;  
GLEBYKH, D.A., tekhn.red.

[Austria, Albania, Greece, and Yugoslavia] Avstriia, Albanii,  
Gretsiia, Iugoslaviia. Moskva, Gos. izd-vo geogr. lit-ry, 1957.  
38 p. (MIRA 11:4)

(Albania--Geography)	(Yugoslavia--Geography)
(Austria--Geography)	(Greece--Geography)

~~MUKHIN~~, Aleksandr Ivanovich; ASOYAN, H.S., red.; KOSHELEVA, S.M., tekhn.  
red.

[Germany (German Democratic Republic, German Federal Republic)]  
Germaniia (Germaniiskaia Demokraticheskaia Respublika, Federativnaia  
Respublika Germanii). Moskva, Gos. izd-vo geogr. lit-ry, 1957.  
103 p. (MIRA 11:5)

(Germany)



MUKHIN, A.I.; GEUSHAKOV, P.I.; GRAVE, L.I.; ASOYAN, N.S., red.; VILENSEKAYA,  
E.N., tekhn.red.

[Germany, Poland, Finland] Germaniya, Pol'sha, Finliandiia.  
Moskva, Gos. izd-vo geogr. lit-ry, 1958. 47 p. (MIRA 11:5)  
(Germany) (Poland) (Finland)

MUKHIN, Aleksandr Ivanovich, kand.geograf.nauk; DOBRIN, K.S., red.;  
KOROLYUK, L.M., red.; ROMANOVA, N.I., tekhn.red.

[Economic geography of the Federal Republic of Germany] Ekono-  
micheskaya geografiya Federativnoi Respubliki Germanii. Moskva,  
Izd-vo IMO, 1960. 256 p. (MIRA 13:11)  
(Germany, West--Economic geography)

VOLKOV, A.V.; KOLOSOVA, Yu.A.; KULAGIN, G.D.; MUKHIN, A.I.; POPOV, K.M.;  
PUCHKOV, I.B.; TIKHOMIROV, V.P.; CHERNIKOV, G.P.

Petr Ivanovich Glushakov, obituary. Izv. AN SSSR. Ser. geog.  
no.5:151 S-0 '61. (MIRA 14:9)  
(Glushakov, Petr Ivanovich, 1893-1961)

MUKHIN, Aleksandr Ivanovich; SMYSLOV, Yu.V., red.; YERKHOVA, Ye.A.,  
tekhn. red.

[German Democratic Republic; its economic geography] Germanskaia  
Demokraticheskaia Respublika; ekonomicheskaja geografiia. Izd.2.,  
dop. 1 perer. Moskva, Izd-vo IMO, 1962. 225 p. (MIRA 16:2)  
(Germany, East--Economic geography)

ZIMOV, V.G.; KONIN, A.D.; MUKHIN, A.I.

Atomic capture of negative muons in chemical compounds. IAd. fiz.  
2 no.5:859-867 N-'65. (MIRA 18:12)

1. Ob'yedinennyy institut yadernykh issledovaniy.

GRACHEV, A.P.; LARYUKHIN, G.A.; MARUKYAN, S.M.; MIRONOV, V.V.;  
MUKHIN, A.I.; PANASIK, A.V.; PONOMAREVA, Ye.N.; SIMSKIY,  
A.M.

[Kolkhoz forester's manual] Spravochnik kolkhoznogo leso-  
voda. Moskva, Lesnaia promyshlennost', 1965. 424 p.  
(MIRA 18:8)

MUKHIN, A. P., prof.

Decisions of the 21st Congress of the CPSU and hygiene tasks in  
improving nutrition for the population. [Trudy] GIDUV no.23:  
45-56 '60. (MIRA 15:7)

(COMMUNISM AND SCIENCE) (NUTRITION)

Mukhin, A.S.

3(5)

PHASE I BOOK EXPLOITATION

SOV/2172

Akademiya nauk SSSR. Mezhdunarodnaya postoyannaya komissiya po zhelezu

Zhelezorudnyye mestorozhdeniya Altaye-Sayanskoy gornoy oblasti, tom. 1, kniga. 1:  
Geologiya (Iron Ore Deposits of the Altay-Sayan Mountain Region, Vol 1,  
Book 1: Geology) Moscow, 1958. 330 p. (Series: Zhelezorudnyye  
mestorozhdeniya SSSR) Errata slip inserted. 2,500 copies printed.

Additional Sponsoring Agencies: Akademiya nauk SSSR. Sibirskoye otdeleniye, USSR.  
Gosudarstvennaya planovaya komissiya. Glavnoye upravleniye nauchno-issledovatel'-  
skikh i proyektnykh organizatsiy, Institut Giproruda, USSR. Ministerstvo  
geologii i okhrany neдр, USSR. Zapadno-Sibirskoye geologicheskoye upravleniye,  
USSR. Krasnoyarskoye geologicheskoye upravleniye, Sibirskiy geofizicheskiy trest,  
Vsesoyuznyy nauchno-issledovatel'skiy geologicheskii institut.

Eds. of the vol.: P. Ye. Sledzyuk, and G.A. Sokolov; Resp. Ed. of Series: I.P.  
Bardin, Academician; Scientific Eds.: I.P. Bardin, Academician, T.F. Gorbachev,  
A.L. Dodin, N.A. Yerofeyev, A.S. Kalugin, N.N. Nekrasov, G.L. Pospelov, M.L.  
Skobnikov, P. Ye. Sledzyuk, S.S. Smirnov-Verin (Deceased) G.A. Sokolov,  
S.G. Strumilin, Academician, V.B. Khlebnikov, N.A. Chinakal, and I.S. Shapiro;

Card 1/9



Iron Ore Deposits (Cont.)

SOV/2172

Ed. of Publishing House: I.G. Kudasheva; Tech. Ed.: I.F. Kuz'min.

**PURPOSE:** This book is intended for structural, exploration and mining geologists, for geophysicists and mineralogists, and industrial planners.

**COVERAGE:** This work purports to be the first attempt to review and summarize all the material that has been published on the iron-ore deposits of the Altay-Sayanskaya oblast' during the last 20 years. This area, the work reports is fast becoming one of the most important iron-ore bases in the Soviet Union. The book discusses the economic aspects of the geography and geology of the individual deposits, presents a qualitative and quantitative (as of January 1, 1957) analysis of ore reserves, and evaluates the prospects and possibilities of further development of the Altay-Sayanskaya iron-ore base. The genetic characteristics of iron-ore mineralization of the area are described. Extensive information on the geology of individual deposits, complexes, and regions is provided, and a general genetic description of ore mineralization in the Altay Sayanskaya region is given. There is a historical account of the exploration and development of the region, and of the development of concepts on the genesis of mineralization in the area. The following scientists participated in the preparation and writing of this volume: G.L. Pospelov, S.S. Lapin, N.Kh. Belous,

Card 2/9

## Iron Ore Deposits (Cont.)

SOV/2172

V.M. Klyarovskiy, O.G. Kine, and V.A. Vakhrushev of the West Siberian Branch of the AN SSSR, I.S. Shapiro of the Permanent Interdepartmental Committee on Iron, A.S. Kalugin, A.S. Mukhin, N.A. Garnets, Yu. A. Speyt, M.I. Selivestrova, V.G. Rutkevich, G.P. Bykov, N.I. Nikonov, and K.G. Sakovich of the West Siberian Geological Administration V.I. Medvedkov, A.S. Aladyshkin and F. Ya. Pan of the Krasnoyarsk Geological Administration, M.G. Rusanov, E.A. Yashutis, Yu. V. Rozhdestvenskiy, G. Ye. Savitskiy, and A.D. Prodanchuk of the West Siberian Geological Survey Chernmetrazvedka Trust, P.A. Lysenko, T.I. Lebedev, T.Ya. Kamenskaya, A.I. Maslennikov and R. Pipar of the Siberian Geophysical Trust, A.L. Dodin of the VSEGEI, A.S. Mitropol'skiy of the Mining Expedition, V.A. Lukin of the Mining Administration of the Kuznetsk Metallurgical Combine, S.S. Zimin of the Tomsk Polytechnic Institute, I.V. Derbikov of the Sibneftegeofizika Trust, and V.G. Korel' of the Siberian Metallurgical Institute. There are 103 diagrams including insert maps and 10 tables. There are 271 references, all Soviet.

Card 3/9

Iron Ore Deposits (Cont.)

SOV/2172

TABLE OF CONTENTS:

Foreword (Academician I.P. Bardin)

5

PART I. GENERAL CHARACTERISTICS OF THE IRON ORE BASE  
OF THE ALTAY-SAYANSKAYA OBLAST'

Ch. 1. Development of the Iron-Ore Base in the Altay-Sayanskaya Mountain Area	11
Historical outline (G.L. Pospelov)	11
Development of a local-iron ore base and metallurgical industry prior to the construction of the Kuznetsk Metallurgical Combine	11
Construction of the Kuznetsk Metallurgical Combine and the expansion of the local iron-ore base during the First-Five-year Plan	13
Period of supplementary exploration and reduction of the estimated total ore reserves	16
Expansion of work on iron and the turning point in the development of the local iron-ore base	18
Ch. 2. Economic Geography and Geology of the Iron-Ore Base of the Altay-Sayanskaya Oblast' (G.L. Pospelov and S.S. Lapin)	28
Brief description of the economic geography of the Altay-Sayanskaya oblast' and its main iron-ore regions	28

Card 4/9

Iron Ore Deposits (Cont.)

SOV/2172

Physicogeographic conditions	30
Economic conditions	31
Economic geography of the main iron-ore regions	34
Description of the total reserves of iron ore in the Altay-Sayanskaya oblast; and probabilities of their increasing	41
General state of iron-ore reserves and their distribution	41
Ore reserves of different mineralogical-genetic types	52
Peculiarities in the distribution and redistribution of ore reserves in iron-ore deposits of different sizes	53
Characteristics and scale of the geological surveys conducted	59
Cost of exploratory drilling in deposits of different structural complexity	60
Future prospects of iron-ore regions and deposits in the Altay-Sayanskaya oblast	64

PART II. GENETIC TYPES OF IRON-ORE DEPOSITS OF THE ALTAY-SAYANSKAYA MOUNTAIN REGION AND GENERAL REGULARITIES IN THEIR DISTRIBUTION AND DEVELOPMENT

Ch. 1. Development of Exploration Principles and Geological-Genetic Concepts on Iron-Ore Mineralization in the Altay-Sayanskaya Mountain Region.

Card 5/9

Iron Ore Deposits (Cont.)	SOV/2172	
Historical Outline (G.L. Pospelov)		71
Research and exploration during the First Five-Year Plans		71
Period of geological and geochemical statistical speculations (1944-1947)		76
Research during the postwar five-year plans		78
Ch. 2. Genetic Types of Iron-Ore Deposits in the Altay-Sayanskaya Oblast' and Their Economic Significance (G.L. Pospelov)		93
Magmatic and magmatic-sedimentary iron-ore deposits		93
Deposits related to intrusive magmatics		93
Deposits directly and indirectly connected with effusive magmatics		118
Sedimentary deposits		123
Deposits in the weathered crust		124
Ch. 3. Composition of the Contact-Metasomatic Iron-Ore Deposits of the Altay-Sayanskaya Oblast'		126
Type minerals and types of ores in the contact-metasomatic iron-ore deposits (O.G. Kine)		126
Ore minerals		126
Non-ore minerals		139
Mineralogical types of ores		145
Main types of ore textures and skarns of contact-metasomatic iron-ore deposits (G.L. Pospelov and S.S. Lapin)		148
Card 6/9		

Iron Ore Deposits (Cont.)

SOV/2172

Mineralogical-geochemical characteristics of the contact-metasomatic iron-ore deposits of the Altay-Sayanskaya oblast' (G.I. Pospelov)	172
Mineralogical types of ore deposits and ore bodies	172
Characteristics of the distribution of accompanying elements	181
Admixtures of minor metals	185
Elements of zoning in skarn iron-ore deposits of Western Siberia (I.V. Derbikov)	189
Ch. 4. Geological Characteristics of the Distribution and Structure of the Main Iron-Ore Regions and Endogenous Iron-Ore Deposits of the Altay-Sayanskaya Oblast' (G.I. Pospelov)	195
Basic characteristics of the geologic structure and main stages of the geotectonic development of the Altay-Sayanskaya folded region	195"
Characteristics of the magmatics of the Altay-Sayanskaya oblast' and their effect on the distribution of iron-ore regions and deposits	200
Characteristics of the development of magmatics and magmatogenetic iron-ore mineralization in the Altay-Sayanskaya oblast' in time and space	201

Card 7/9

Iron Ore Deposits (Cont.)

80V/2172

Material composition characteristics of the development of the magmatics of the Altay-Sayanskaya oblast' and their relationship to endogenous iron-ore formation	208
Structural regularities in the distribution of main iron-ore regions	231
General structural characteristics of the Altay-Sayanskaya oblast'	231
Basic characteristics of structural placement of iron-ore regions	235
Structural characteristics of iron-ore complexes and zones	240
Post-ore fissure tectonics and its effect on mining operations (S.S. Lapin)	261
Ch. 5. Geological-Genetic Characteristics of Exogenous and Sedimentary-Metamorphic Iron-Ore Manifestations of the Altay-Sayanskaya Mountain Range and Its Confines (N. Kh. Belous)	281
Metamorphism of sedimentary iron ores	283
Genetic classification of sedimentary iron-ore manifestations	284
Brief description of iron-ore manifestations of various genetic types	288
Stratigraphic grouping of ore manifestations and times of iron-ore deposition	300
Space distribution of iron-ore depositions of different genetic types in Western Siberia	307
General industrial and possibilities evaluation of sedimentary-metamorphic ore manifestations	308

Card 8/9

Iron Ore Deposits (Cont.)

SOV/2172

Ch. 6. General Characteristics of the Magnetic Anomalies in Gornaya  
Shoriya, Kuznetskiy Alatau and Salair (P.A. Lysenko, T.I. Lebedev,  
T. Ya. Kamenskaya, A.I. Maslennikov, A.S. Mukhin)

313

Bibliography

319

AVAILABLE: Library of Congress

Card 9/9

MM/mas  
8-13-59



VOZNESENSKIY, A.A., kand.tekhn.nauk, dots.; MUKHIN, A.S., inzh.

Utilizing oxidized Gornaya Shoriya magnetites. Izv. vys. ucheb.  
zav.; chern. met. no.3:16-20 Mr '58. (MIRA 11:5)

1.Sibirekiy metallurgicheskiy institut i Zapadno-Sibirskoye  
geologicheskoye upravleniye.  
(Gornaya Shoriya--Magnetite)

KALUGIN, A.S., insh.; MUKHIN, A.S., insh.; HUSANOV, M.G., kand. geologo-miner. nauk; ~~TUNIN, L.B., insh.~~

Iron ore base for the Kuznetak and West Siberian metallurgical combines. Izv. vys. ucheb. zav.; chern. met. no.4:3-10 Ap '58.  
(MIRA 11:6)

1. Zapadno-Sibirskoye geologicheskoye upravleniye i Kuznetskiy metallurgicheskiy kombinat.

(Siberia, Western--Iron ores)

MUKHIN, A.G., inzhener; VOLKOV, K.V., inzhener.

Combined hoisting mechanism for excavators E-1003 and E-1004. Mekh.stroi.  
10 no.10:9-10 0 '53. (MIRA 6:9)

(Excavating machinery)

MUKHOM, A.S., inzhener; FEDOROV, G.A., inzhener.

Holder for cermet cutting tools. Stroi. i dor.mashinostr. 1 no.2:34-  
35 # '56. (MIRA 10:1)

(Cutting tools)

KONCHALOVSKAYA, N.M.; POPOVA, T.B.; SMIRNOVA, M.I.; MUKHIN, A.S.

Clinicomorphological characteristics of toxic (occupational)  
hepatitis. Vest. AMN SSSR 19 no.7:27-30 '64.

(MIRA 18:3)

1. Institut gigiyeny truda i professional'nykh zabolevaniy  
AMN SSSR, Moskva i I Moskovskiy meditsinskiy institut imeni  
Sechenova.

MUKHIN, A.T., kand.istoricheskikh nauk

Leading role of party organizations in the introduction of new techniques in industrial enterprises; work practices of the party organisation of the Minsk Automobile Plant in 1957-1958. Sbor. nauch.trud.Bel.politekh.inst. no.71:164-183 '59.(MIRA 13:5)  
(Minsk--Automobile industry)  
(Communist Party of the Soviet Union--Party work)

MUKHIN, A.V.; ANTONYUK, Ye.I.

Summing up the results of the Fifth-All-Union Scientific and  
Technical Geophysical Conference. Neft. i gaz. prom. no.1\*67  
Ja-Mr '64. (MIRA 18.2)

1000000, B.

Builders have received a new document. Izobr. i rats. no.8:  
30 Ag '61. (MIRA 14:9)  
(Construction industry--Technological innovations)



MUKHIN, B.I.; IVANOV, B.A.

Cutter with mechanical drive for the cutting of synthetic  
and reclaimed rubber. Kauch. i rez. 23 no.6:57 Je '64.  
(MIRA 17:9)

1. Voronezhskiy shinnyy zavod.

MUKHIN, B.I.

Mechanisation and automation of the lubrication of packing  
systems for rubber mixers. Kauch.i rez. 22 no.2:47-48  
F '63. (MIRA 16:2)

1. Voronezhskiy shinnyy zavod.  
(Mixing machinery--Lubrication)  
(Automation)

Мухомов, Д. И.  
MUKHIN, D.I.

Incubating goose eggs at the Rostov Hatchery. Ptitsevodstvo 8 no.3:  
24-25 Mr '58. (MIRA 11:2)

1. Direktor Rostovskoy inkubatorno-ptitsevodcheskoy stantsii, Yaroslavskoy oblasti.

(Rostov--Incubation) (Geese)

**MUKHIN, D.I.**

Goose section on a collective farm. Ptitsevodstvo 9 no.2:12  
P '59. (MIRA 12:3)

1. Direktor Kostovskoy inkubatorno-ptitsevodcheskoy stantsii,  
Yaroslavskoy oblasti.  
(Ketrovskoye District--Goose)

MUKHIN, D.P.; SUSLOVA, A.L.; SHEVCHENKO, K.A.; BUNINA, S.S.; KOPEYKO, I.P.;  
KROPOTUKHINA, I.V.

Application of therapeutic sleep in pulmonary tuberculosis in thoracic surgery. Probl. tuberk., Moskva no. 4:11-15 July-Aug. 1952.

(CIAML 22:5)

1. Senior Scientific Associate for Suslova; Scientific Associate for Shevchenko, Bunina, and Kopeyko; Clinical Departmental Head for Kropotukhina. 2. Of the First Surgical Clinic (Head -- D. P. Mukhin). Institute of Climatotherapy of Tuberculosis (Director -- Ye. D. Petrov). Yalta.

1. MUKHIN, D. P., SHEVCHENKO, K. A., BUNINA, S. S.
2. USSR (600)
4. Tuberculosis
7. Healing of bronchial fistulas following cavernotomy.  
Khirurgia No. 11, 1952
9. Monthly List of Russian Accessions, Library of Congress, March 1953, Uncl.

MUKHIN, G.F. prof., doktor sel'skokhozyaystvennykh nauk; SOROKER, V.S.,  
kand.sel'skokhozyaystvennykh nauk

Mountain virgin lands in the Northern Caucasus. Zhivotnovodstvo  
23 no.6:7-12 Je '61. (MIRA 16:2)

1. Severo-Osetinskiy sel'skokhozyaystvennykh institut (for  
Mukhin).

(Caucasus, Northern—Pastures and meadows)  
(Caucasus, Northern—Sheep)

МУХИН, Г.Г.

Stainless steel of the austenite-martensite class (from foreign practices). Metalloved. 1 term. obr. met. no.8:57-63 Ag '60.  
(Steel, Stainless) (MIRA 13:9)



3/125/63/000/001/010/012  
A006/A106

AUTHOR: Mukhin, G. G.

TITLE: A reactive agent for revealing the microstructure in austenite-  
-ferrite joints

PERIODICAL: Avtomaticheskaya svarka, no. 1, 1963, 90 - 91

TEXT: The effect of a reactive agent, composed of one portion 14%-aqueous solution of ammonium persulfate, two portions of 50% aqueous solution of hydrochloric acid, and one portion of alcoholic saturated solution of orthonitrophenol, was studied on type 18-8 steel manually welded joints. To reveal the microstructure, the reactive agent should be used immediately after its preparation. The polished section surface is to be washed with alcohol. The section is placed into the reactive agent at room temperature for 15 - 30 sec. Experimental etching of welds, additionally alloyed up to 5.2% Si, to 23% Cr or to 1.2% Si and 2% V content, shows the suitability of the reactive agent for etching, if ferrite and other phases are contained in the structure. The use of an agent containing orthonitrophenol reveals distinctly the distribution of secondary phases in the

Card 1/2

3/125/63/000/001/010/012  
A reactive agent for revealing the microstructure in... A006/A106  
austenite base. The determination of each structural components must be performed  
by other methods. There are 2 figures.

✓

Card 2/2

YASTREBENETSKIY, A.R.; KOVALENKO, L.M.; MUKHIN, I.N.; TOVAZHNYANSKIY, L.L.

Cooling of the tar liquor in plate heat exchangers. Koks i khim. no.3:  
38-41 '63. (MIRA 16:3)

1. Khar'kovskiy politekhnicheskii institut.  
(Heat exchangers) (Coal tar products—Cooling)

MUKHIN, I.V.

Starting of production of the RL-60-1 apparatus. Geofiz.razved.  
no.10:82-86 '62. (MIRA 15:12)  
(Logging (Geology)—Equipment and supplies)